

## REMARKS

The Applicants thank the Examiner for the quick and courteous final Action and the entry of the Amendment on 26 October 2011.

Claims 1-12 remain in the application.

Claims 1-12 are rejected.

Claims 13-20 are canceled without prejudice to Applicants' right to present such claims at a later time in a continuing application.

### 35 U.S.C. §102(b) and New 35 U.S.C. §103(a) Rejection

The Examiner has rejected claims 1-12 under 35 U.S.C. §102(b) as allegedly being anticipated by or, in a new rejection, in the alternative as allegedly obvious under 35 U.S.C. §103(a) from Johannes, US Patent 4053142 for the reasons set out in the final Action of November 1, 2011.

The Applicants respectfully traverse. A patent claim is anticipated, and therefore invalid, only when a single prior art reference discloses each and every limitation of the claim. *Glaxo Inc. v. Novopharm Ltd.*, 52 F.3d 1043, 1047, 34 U.S.P.Q.2d 1565 (Fed. Cir.), cert. denied, 116 S.Ct. 516 (1995). The Applicant submits that it is the Examiner's burden to establish a case of *prima facie* obviousness of the pending claims, *In re Oeticker*, 977 F.2d 1443, 1445; 24 U.S.P.Q.2d 1443 (Fed. Cir. 1992), and that as will be established, a *prima facie* case of obviousness has not been made herein.

Previously, the Examiner did not give any weight to the Applicants' argument that the claimed apparatus for enhancing solubility only had a single series of tangential slots. In the Amendment filed 26 October 2011, claim 1 was amended to explicitly recite "with only a single series of tangential slots" to make this distinction over Johannes excruciatingly clear.

Now the Examiner has changed his reasoning and is contending that despite the fact the Johannes only, consistently and repeatedly discloses two series of tangential slots (admitted by the Examiner at the top of page 4 of the final Action), it somehow would be obvious to omit one of the series if their function was not desired.

First, the Applicants respectfully submit that there is no teaching, suggestion or motivation *in the reference* for the omission because Johannes clearly and explicitly requires the two opposing rotation fluid flow patterns to intentionally “clash” to create a large amount of turbulence as the way to mix the first fluid and the second fluid.

More specifically and again, the Applicants respectfully note that the Johannes only discloses two series of openings, not only or simply one. The Examiner’s attention is respectfully directed to Johannes’ Abstract:

A nonmechanical shearing mixer uses fluid velocity *to create sufficient turbulence to completely mix two fluid components*. Mixing is accomplished in an annular mixing chamber defined by inner and outer cylindrical walls. *A first fluid is forced under pressure outwardly through openings in the inner cylindrical wall, the openings being oriented and arranged to cause the first fluid passing therethrough to undergo a generally rotational fluid flow pattern in the annular mixing chamber. A second fluid entering the annular mixing chamber through openings in the outer cylindrical wall is similarly caused to undergo a generally rotational fluid flow pattern but in the opposite direction of the rotational fluid flow pattern of the first fluid. The two opposing rotational fluid flow patterns thus “clash” in the annular mixing chamber and create a large amount of turbulence and shearing action resulting in effective and complete mixing of the two fluids.* The mixed fluid components are continuously discharged from the annular mixing chamber. (Emphasis added.)

The Examiner’s attention is also respectfully directed to Johannes’ FIGS. 1 and 2, and column 2, lines 34-68:

FIGS. 1 and 2 are section views respectively of a presently preferred embodiment of the invention. In the fluid mixing device shown, two fluid components are effectively and completely mixed by turbulence created in an annular mixing chamber **10**. A first fluid component is supplied under pressure to a first inlet tube **12** from which the first fluid passes into an annular outer chamber **14**. As the outer chamber **14** becomes filled with fluid, the first fluid is forced through *a first series of ports 16*. The ports **16** are so oriented and arranged as to cause the first fluid to assume a generally clockwise (as seen from FIG. 1) rotational fluid flow pattern in the annular mixing chamber **10**. A second fluid is fed under pressure through a second inlet port **18** to a cylindrical inner chamber **20**. As the inner chamber **20** fills with fluid, the second fluid is forced through *a second series of ports 22* oriented and arranged so as to cause the second fluid to flow in a generally counter-clockwise (as seen from FIG. 1) fluid flow pattern in the annular mixing chamber **10**.

In the annular mixing chamber **10**, therefore, the rotational fluid flow patterns of the first and second fluid components (clockwise and counter-

clockwise respectively) crash head on and create a tremendous amount of shearing turbulence. *This turbulence is further increased by orienting the ports 16 and 22 as shown in FIG. 2, thereby tending to cause the fluid components in the annular mixing chamber to initially flow towards the bottom portion 24 of the mixing chamber 10 before being discharged from the top portion of the mixing chamber 10 through an outlet tube 26. The turbulence thus created is sufficient to thoroughly mix the first and second fluid components.* As stated, the fluid mixture is discharged from the fluid mixing device through an outlet tube 26. (Emphasis added.)

The Examiner's attention is also respectfully directed to the claims of Johannes, particularly claims 1 and 2 where a first and second series of ports is always required:

1. Apparatus for mixing first and second fluid components, said apparatus comprising;
  - a. means defining an outer chamber into which the first fluid is supplied under pressure;
  - b. means defining an inner chamber into which the second fluid is supplied under pressure;
  - c. means defining an annular mixing chamber interposed between said inner and outer chambers, *said annular mixing chamber having a first and second series of ports therein to said outer and inner chambers respectively, said first series of ports so oriented that the first fluid flowing there-through from said outer chamber to said annular mixing chamber assumes a generally rotational fluid flow pattern in said annular mixing chamber, said second series of ports so oriented that the second fluid flowing there-through from said inner chamber to said annular mixing chamber assumes a generally rotational fluid flow pattern in said annular mixing chamber but in a direction generally opposite that of said first fluid rotational fluid flow pattern;* and
  - d. means for discharging fluid from said annular mixing chamber.
2. Apparatus as claimed in claim 1 wherein *said first and second series of ports* are arranged to direct the first and second fluids respectively passing there-through in a direction away from said discharge means. (Emphasis added.)

In the Action the Examiner contends in the middle of page 4 thereof:

However, should applicant disagree with this interpretation [that Johannes supposedly constitutes only a single series of tangential slots], the examiner cites MPEP §2144.04(II)A, which teaches that the omission of an element and its function is obvious if the function of the element is not desired. As such, it would be obvious to omit either of the sets of inlet ports (16 or 22 of Johannes '142) if their function was not desired. Therefore it would have been obvious to one having ordinary skill in

the art at the time of invention to have further provided an apparatus wherein the fluidizing unit had only a single series of tangential slots in the apparatus of Johannes '142, if not anticipated thereby, in order to remove a component whose function was not desired.

The Applicants respectfully submit that the Johannes apparatus is a nonmechanical shearing mixer. Its purpose is to use “fluid velocity to create sufficient turbulence to completely mix two fluid components” (Abstract). As established above, the only way that Johannes teaches that his apparatus accomplishes this is by using a first series of ports **16** “so oriented and arranged as to cause the first fluid to assume a generally clockwise (as seen from FIG. 1) rotational fluid flow pattern in the annular mixing chamber **10**” (col. 2, lines 43-46) and “a second series of ports **22** oriented and arranged so as to cause the second fluid to flow in a generally counter-clockwise (as seen from FIG. 1) fluid flow pattern in the annular mixing chamber **10**” (col. 2, lines 49-53). The Applicants respectfully submit that one having ordinary skill in the art reviewing Johannes would understand that both the first series of ports **16** and the second series of ports **22** are necessary to use “fluid velocity to create sufficient turbulence to completely mix two fluid components” in order to achieve the complete mixing of the two components. Why would such one having ordinary skill in the art omit one of the series of ports? If this were done, complete mixing would not occur and the Johannes device would not function for its stated purpose.

An obviousness rejection is invalid if combining references as the examiner suggests would destroy them for their intended purpose; *Ex parte Westphalen*, 159 U.S.P.Q. 507 (Bd. App., 1967). In the present case, there is only one reference. Nevertheless, the Applicants respectfully submit that the reasoning of *Ex parte Westphalen* applies and that the present obviousness rejection is invalid if modifying the single reference as the Examiner suggests would destroy it for its intended purpose. The intended purpose of the Johannes is to completely mix two fluid components. This cannot be done if one of the series of ports is omitted.

The Examiner cites “MPEP §2144.04(II)A, which teaches that the omission of an element and its function is obvious if the function of the element is not desired”. The Applicants respectfully submit that in each of the three cases cited in this portion of the MPEP, there was reason for one having ordinary skill in the art to understand that the

invention would function for its intended purpose after the omission of an element and its function.

In *Ex parte Wu*, in the method for inhibiting corrosion, the polybasic salts could be omitted because the corrosion inhibiting property was supplied by petroleum sulfonate (disclosed in a secondary reference) and the Board determined that if corrosion resistance was not desired or required in an environment that did not encounter fresh water one may choose to omit the polybasic acid salt. Such a secondary reference is not present in the instant situation.

In *In re Larson*, the additional framework and axle to increase the cargo carrying capacity could be omitted if the increased cargo carrying capacity was not desired – cargo could still be carried, just not as much. In the present situation, if one of the series of ports is omitted, the Johannes nonmechanical shearing device ceases to function for its stated purpose.

In *In re Kuhle*, deleting a switch member and eliminating its function did not cause the entire apparatus to cease to function. In the present situation, if one of the series of ports is omitted, the Johannes nonmechanical shearing device ceases to function for its stated purpose.

Second, it appears that the Examiner wants to be able to interpret Johannes two different ways simultaneously. That is, when it suits the Examiner's purpose in making a 35 U.S.C. §102(b) rejection, Johannes is interpreted to teach two series of slots. When it suits the Examiner's purpose in making a 35 U.S.C. §103(a) rejection, Johannes is interpreted to be obvious to be modified to have only one series of slots.

Third, the Applicants respectfully note that when the Applicants' apparatus is in operation the active mixing structure is in a different place than the active mixing structure in Johannes. In Johannes, the active mixing structure is the sufficient turbulence and shearing action that occurs internally inside the annular mixing chamber **10** (please see the excerpts from the Abstract and col. 2 quoted at length *supra*). In contrast, in the claimed invention, the active mixing structure is the inverted vortex that is *external* and *outside* the apparatus. The Applicants respectfully direct the Examiner's attention to page 14, line 16 to page 15, line 2 of the application as filed, as well as to FIG. 4:

Figure 4 shows that the swirling exiting fluid (solvent) from the HydroTrans head produces *an inverted vortex at the entry to the discharge pipe, which is considered to be fairly stable under normal velocity flow conditions, resulting in enhanced mobilisation of solids surrounding the HydroTrans head. The vortex generally has a low pressure core or zone compared to that of the rotating liquid around it (see Figure 3). This can create a boundary layer of liquid rotating around this core where the core's pressure may be close to the vapour pressure of the liquid (solvent) being used thus allowing the water at this point to become excited leading potentially to cold boiling. For example, water, whilst still below its natural boiling temperature, can behave as boiling water (water surface tension reduces, and may even affect the water's natural capillary force) which may approach endothermic conditions at certain temperatures which could increase the solubility of the solute in question.* (Emphasis added.)

The distinct difference in the location of the active mixing structure between Johannes and the Applicants' apparatus is due at least in part to the structure of the apparatus as recited in the present claims.

Since Johannes consistently, repeatedly and exclusively requires the presence of two series of ports, the Applicants respectfully submit that the single prior art reference does not disclose each and every limitation of the invention, namely *only a single* series of tangential slots. Johannes does not disclose a *single* series of tangential slots, but instead everywhere and consistently teaches two series of ports, nor does Johannes in any way suggest or hint that one of the series of ports may be omitted. Even if there was a reason or motivation for one of the series of ports of Johannes to be omitted, the nonmechanical shearing mixer of Johannes would *cease to function for its stated purpose*.

Thus because the single prior art reference does not disclose each and every limitation of the amended claims, the Applicants respectfully submit that the instant §102(b) rejection should be withdrawn. Further, the Applicants respectfully submit that there is no reason given within the single Johannes why one having ordinary skill in the art would omit one of the series of ports, and even if such one of the series of ports were omitted, the Johannes would *cease to function for its stated purpose*. Thus, the Applicants respectfully submit that the Examiner has not established a *prima facie* obviousness rejection. Reconsideration is respectfully requested.

### Request for Entry of Amendment

The Applicants would respectfully request that the instant Amendment be entered under 37 CFR §1.116(c): “If amendments touching the merits of the application or patent under reexamination are presented after final rejection, or after appeal has been taken, or when such amendment might not otherwise be proper, they may be admitted upon showing of good and sufficient reasons why they are necessary and were not earlier presented.” The Applicants submit that the reason why the arguments above are necessary and were not earlier presented is simply because *the rejection addressed was not earlier presented*, before the final rejection. The rejection based on Johannes under 35 U.S.C. §103(a) is new. For the Applicants to have a chance to fully address the instant rejections, particularly the new 35 U.S.C. §103(a) rejection, the arguments herein must be entered and considered. In view of the new rejection, it is inequitable for the present Amendment not to be entered and considered.

Finally, the Applicants respectfully submit that the instant claims are in immediate condition for allowance and this fact alone necessitates the entry of this amendment. Entry of the instant amendment would thus conserve the resources of the Office and the Applicants.

It is respectfully submitted that the arguments presented above place the claims in condition for allowance. Reconsideration and allowance of the remaining claims are respectfully requested. The Examiner is respectfully reminded of his duty to indicate allowable subject matter. The Examiner is invited to call the Applicants’ attorney at the number below for any reason, especially any reason that may help advance the prosecution.

Respectfully submitted,  
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